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| 10/797,561      | 03/11/2004  | Jose Nunez-Regueiro  | 3691-662            | 4822             |

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| EXAMINER |
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BLACKWELL RUDASIL, GWENDOLYN A

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| ART UNIT | PAPER NUMBER |
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1775

DATE MAILED: 01/26/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/797,561

Applicant(s)

NUNEZ-REGUEIRO ET AL.

Examiner

Gwendolyn Blackwell

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 31 October 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-40 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3, 5, 6, 8-14, 16 and 18-40 is/are rejected.
- 7) ☒ Claim(s) 4, 7, 15 and 17 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 7/05.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Terminal Disclaimer*

1. The terminal disclaimer filed on October 31, 2005 disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of any patent granted to Serial Numbers 10/645,838 and 10/914,646 has been reviewed and is accepted. The terminal disclaimer has been recorded.

### *Claim Rejections - 35 USC § 102*

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

*(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.*

*(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.*

3. Claims 22-29 are rejected under 35 U.S.C. 102(b) as being anticipated by United States Patent no. 6,045,896, Boire et al.

Applicant's claim 22 requires that the following structure is comprised of:

tin oxide/zinc oxide/Ag

wherein one IR reflecting layer (Ag) is directly on and contacting a layer comprising zinc oxide and the zinc oxide layer is directly on and contacting a layer comprising tin oxide. The other Ag layer can be located above the first Ag layer or below the tin oxide layer. Claim 22 also requires further limitations regarding physical characteristics related to heat treating.

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*Regarding claim 22*

Boire et al disclose a glazing assembly comprised of a transparent substrate with a multilayer coating formed thereon, (column 1, lines 8-14). Table 1 discloses the following structure, (column 11), meeting the requirements of claim 22:

| TABLE 1                        |      | EXAMPLE 1             | EXAMPLE 2 | EXAMPLE 3              |
|--------------------------------|------|-----------------------|-----------|------------------------|
| Glass                          | (1)  | —                     | —         | —                      |
| SnO <sub>2</sub>               | (2a) | 20                    | 20        | 20                     |
| ZnO                            | (2b) | 17                    | 17        | 17                     |
| Ag                             | (3)  | 9                     | 9         | 9                      |
| Nb                             | (4)  | 0.7                   | 0.7       | 0.7                    |
| Si <sub>3</sub> N <sub>4</sub> | (5a) | 65                    | 65        | 65                     |
| ZnO                            | (5b) | 25                    | 25        | 25                     |
| Ag                             | (6)  | 9                     | 9         | 9                      |
| Nb                             | (7)  | 0.7                   | 0.7       | 0.7                    |
| Layer 8a                       | (8a) | {WO <sub>3</sub> }: 2 | {ZnO}: 2  | {SnO <sub>2</sub> }: 2 |
| Si <sub>3</sub> N <sub>4</sub> | (8b) | 37.5                  | 37.5      | 37.5                   |

When the structure recited in the reference is substantially identical to that of the claims, the claimed properties or function are presumed inherent. *MPEP 2112.01*. Because the prior art exemplifies the applicant's claimed multilayer coating, the claimed physical properties relating to heat treatment, visible light transmission parameters and sheet resistance are inherently present in the prior art. Absent an evidentiary showing to the contrary, the addition of the claimed physical properties to the claim language fails to provide patentable distinction over the prior art of record, meeting the requirements of claims 22-29.

4. Claims 30-35 are rejected under 35 U.S.C. 102(a) as being anticipated by United States Patent Application Publication no. 2003/0170466, Stachowiak.

Applicant's claims 30 and 35 require that the following structure is comprised of:

Ag/tin oxide/Ag

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wherein the first and second IR reflecting layers are spaced apart by at least one layer comprising tin oxide. Each claim further requires certain physical characteristics related to heat treating.

*Regarding claims 22-35*

Stachowiak discloses a coated article having the following layer structure, (Example 9, page 10, sections 0163-0174):

[0164] glass ( $n=1.51$ )  
[0165] silicon zirconium nitride ( $\text{SiZrN}_x$ ) ( $n=2.2$ - $2.45$ , preferably  $n=2.32$ )  
[0166] nickel-chromium-oxide ( $\text{NiCrO}_x$ )  
[0167] silver (Ag)  
[0168] nickel-chromium-oxide ( $\text{NiCrO}_x$ )  
[0169] silicon zirconium nitride ( $\text{SiZrN}_x$ ) ( $n=2.2$ - $2.45$ , preferably  $n=2.32$ )  
[0170] tin oxide (e.g.,  $\text{SnO}_2$ ) ( $n=1.8$  to  $2.2$ , preferably  $n=2.0$ )  
[0171] nickel-chromium-oxide ( $\text{NiCrO}_x$ )  
[0172] silver (Ag)  
[0173] nickel-chromium-oxide ( $\text{NiCrO}_x$ )  
[0174] silicon zirconium nitride ( $\text{SiZrN}_x$ ) ( $n=2.2$ - $2.45$ , preferably  $n=2.32$ )

Because the prior art exemplifies applicant's claimed multilayer coating, the claimed physical properties relating to heat treatment, visible light transmission parameters and sheet resistance are inherently present in the prior art, meeting the requirements of claims 30-35.

*MPEP 2112.01.*

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

*(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.*

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claims 1-3, 5-6, 8-14, 16, 18-21 and 36-40 are rejected under 35 U.S.C. 103(a) as being unpatentable over United States Patent Application Publication no. 2003/0170466, Stachowiak.

Applicant's claim 1 requires a layer structure comprising:

dielectric/1<sup>st</sup> IR/silicon nitride/tin oxide/zinc oxide/2<sup>nd</sup> IR/dielectric

wherein the tin oxide is contacting the silicon nitride, the zinc oxide is contacting the tin oxide, and the second IR layer is contacting the layer comprising zinc oxide.

Applicant's claim 12 requires a layer structure comprising:

silicon nitride/tin oxide/zinc oxide/IR/dielectric

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wherein the tin oxide is contacting the silicon nitride, the zinc oxide is contacting the tin oxide, and the IR layer is contacting the zinc oxide.

The limitations for claim 35 have been set forth above.

Applicant's claim 37 requires a layer structure comprising:

1<sup>st</sup> dielectric/1<sup>st</sup> Ag/1<sup>st</sup> silicon nitride/1<sup>st</sup> metal oxide/1<sup>st</sup> zinc oxide/2<sup>nd</sup> Ag/another dielectric wherein the 1<sup>st</sup> metal oxide is contacting the silicon nitride, the 1<sup>st</sup> zinc oxide is contacting the 1<sup>st</sup> metal oxide, and the 2<sup>nd</sup> Ag layer is contacting the 1<sup>st</sup> zinc oxide layer.

*Regarding claims 1-2, 5-6, 12-13, 16, 36-38, and 40*

Stachowiak disclose an IG window unit, (page 1, section 0025). Example 9 (page 10, sections 0163-0174) discloses the following layer structure:

[0164] glass (n=1.51)  
[0165] silicon zirconium nitride ( $\text{SiZrN}_x$ ) (n=2.2-2.45, preferably n=2.32)  
[0166] nickel-chromium-oxide ( $\text{NiCrO}_2$ )  
[0167] silver (Ag)  
[0168] nickel-chromium-oxide ( $\text{NiCrO}_2$ )  
[0169] silicon zirconium nitride ( $\text{SiZrN}_x$ ) (n=2.2-2.45, preferably n=2.32)  
[0170] tin oxide (e.g.,  $\text{SnO}_2$ ) (n=1.8 to 2.2, preferably n=2.0)  
[0171] nickel-chromium-oxide ( $\text{NiCrO}_2$ )  
[0172] silver (Ag)  
[0173] nickel-chromium-oxide ( $\text{NiCrO}_2$ )  
[0174] silicon zirconium nitride ( $\text{SiZrN}_x$ ) (n=2.2-2.45, preferably n=2.32)

Stachowiak does not specifically disclose that a ZnO layer above and in direct contact with the tin oxide layer or that the layer formed directly under the first Ag layer is ZnO or  $\text{ZnAlO}_x$ .

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The  $\text{NiCrO}_x$  layers are contact layers that can also be ZnO or  $\text{ZnAlO}_x$ , (page 2, section 0041). As Stachowiak discloses that ZnO or  $\text{ZnAlO}_x$  can also be used for the contact layers, it would be obvious to one skilled in the art at the time of invention to modify the  $\text{NiCrO}_x$  with either ZnO or  $\text{ZnAlO}_x$  as Stachowiak has disclosed the zinc oxide as being functionally similar to  $\text{NiCrO}_x$ .

*Regarding claims 3, 8-10, 14, 18-20, and 39*

After the coated substrate has been annealed (heat treated) the coated substrate has a visible transmittance of 77.4%, (page 11, section 0180). Although, the particular embodiment 9 does not specifically provide for a visible transmittance of at least 78%, the focus of the prior art is to increase the visible transmittance of the coated substrate based upon the use of dielectric layers, (page 2, section 0043). The sheet resistance of the coated substrate is most preferably less than 4.0 ohms/square. The sheet resistance of less than 4.0 ohms/square encompasses the range of less than or equal to 3.0/2.5/2.1 ohms/square, (page 2, section 0042). It would have been obvious to one skilled in the art at the time of invention to lower the sheet resistance and increase the visible transmittance of the coating through optimization of the thickness of the Ag and dielectric layers in order to achieve the desired thermal performance, (page 2, sections 0042-0043).

*Regarding claims 11 and 21*

Stachowiak discloses the coating can be used as part of insulating glazing units, (page 1, section 0025). Stachowiak further discloses that the  $\text{NiCrO}_x$  layers are contact layers that can also be ZnO or  $\text{ZnAlO}_x$ , (page 2, section 0041). As it is within the realm of one of ordinary skill in the art to modify the contact layers to create the layer structure of Applicant's claims 1 and 12,



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it would be expected that the insulated glazing units utilizing the modified coating would have the a visible transmittance of at least 60% and a SGHC value of less than or equal to 0.40.

***Allowable Subject Matter***

8. Claims 4, 7, 15, and 17 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The prior art of record while teaching and suggesting the layer broader layer structure as set forth in claims 1, 12, 22, 30, 35, and 37, does not teach or suggest an additional layer of tin oxide below the first silicon nitride layer. It is also not taught or suggested that the silicon nitride layer is non-stoichiometric having the ratio limitations as set forth in claims 7 and 17.

***Response to Arguments***

9. Applicant's arguments, see pages 11-17, filed October 31, 2005, with respect to the rejections under Thomsen et al and Laird in view of Lingle have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection has been set forth above under Stachowiak.

10. Applicant's arguments filed October 31, 2005 have been fully considered but they are not persuasive with regards to the rejection made under Boire et al.

11. Applicant contends that Boire et al does not teach or suggest the physical properties as set forth in claims 22-29.

This is not persuasive as Applicant has not provide evidence to the contrary that the physical properties would not be present in Boire. Mere allegations that because Boire does not

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specifically teach the physical properties therefore they must not be present is not evidence nor is it an indication that the properties would not be there. The layer structure of the Boire coating contains all of the layers in the proper order as claimed by Applicant. As such and absent a showing to the contrary that the coating structure would not contain the physical properties of Boire, the rejection stands.


### *Conclusion*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gwendolyn Blackwell whose telephone number is (571) 272-1533. The examiner can normally be reached on Monday - Thursday; 6:30 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jennifer McNeil can be reached on (571) 272-1540. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Gwendolyn Blackwell  
Examiner  
Art Unit 1775



JENNIFER MCNEIL  
PRIMARY EXAMINER  
1/23/06